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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,540	12/05/2003	Masato Higuchi	36856.1178	8279

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EXAMINER

MAYES, MELVIN C

ART UNIT PAPER NUMBER

1734

DATE MAILED: 11/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/728,540

Applicant(s)

HIGUCHI ET AL.

Examiner

Melvin Curtis Mayes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4-25,33 and 34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,2 and 4-25 is/are allowed.
- 6) ☒ Claim(s) 33 and 34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

(1)

The indicated allowability of the subject matter of claims 15-17 and 35 (the subject matter of Claim 35 now included in Claim 33) is withdrawn in view of the newly discovered reference(s) to Uchikoba and JP 61-295025 Abstract. Rejections based on the newly cited reference(s) follow.

***Claim Rejections - 35 USC § 103***

(2)

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

(3)

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa et al. 6,262,513 in view of Uchikoba 2002/0044030.

Furukawa et al. disclose a method of producing an electronic component comprising: connecting a surface acoustic wave (SAW) device having an electrode to a printed circuit board such as ceramic having wiring pattern through bumps disposed on the device; disposing a preformed sheet of resin on the device; heating to melt the resin sheet to coat the device and connect to the printed circuit board; and hardening the resin. Furukawa et al. disclose that a plurality of surface acoustic wave devices can be assembled with an aggregate of printed circuit boards, a sheet of resin aligned to the aggregate and melted and hardened, then the aggregate of printed circuit boards is divided (dicing) with the resin sheet to obtain a plurality of individual

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surface acoustic wave apparatuses (col. 121 and 128, Fig. 14). Furukawa et al. do not disclose treating the surface of the ceramic circuit board (mounting substrate) by plasma-irradiation.

Uchikoba teaches that in mounting surface acoustic wave (SAW) elements on a ceramic substrate, the ceramic substrate is subjected to a cleaning procedure such as plasma cleaning with argon plasma prior to mounting the SAW elements [0069],[0079].

It would have been obvious to one of ordinary skill in the art to have modified the method of Furukawa et al. for mounting a SAW device on a ceramic substrate by subjecting the ceramic board substrates to argon plasma (plasma irradiation) before mounting the SAW devices, as taught by Uchikoba, to clean the ceramic substrate. By subjecting the ceramic substrate to cleaning by argon plasma, the substrate is surface-modification treated by plasma irradiation, as claimed.

(4)

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa et al. 6,262,513 in view of JP 61-295025 Abstract.

Furukawa et al. disclose a method of producing an electronic component comprising: connecting a surface acoustic wave (SAW) device having an electrode to a printed circuit board such as ceramic having wiring pattern through bumps disposed on the device; disposing a preformed sheet of resin on the device; heating to melt the resin sheet to coat the device and connect to the printed circuit board; and hardening the resin. Furukawa et al. disclose that a plurality of surface acoustic wave devices can be assembled with an aggregate of printed circuit boards, a sheet of resin aligned to the aggregate and melted and hardened, then the aggregate of printed circuit boards is divided (dicing) with the resin sheet to obtain a plurality of individual

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surface acoustic wave apparatuses (col. 121 and 128, Fig. 14). Furukawa et al. do not disclose treating the surface of the ceramic circuit board (mounting substrate) by corona-discharge or plasma.

JP 61-295025 Abstract teaches that in bonding a resin thin film to a substrate such as of ceramic, the resin film and substrate may be treated with corona or plasma.

It would have been obvious to one of ordinary skill in the art to have modified the method of Furukawa et al. for mounting a SAW device on a ceramic substrate by subjecting the ceramic board substrates to corona discharge or plasma, as taught by JP '025 Abstract, as treatment performed of both a substrate such as ceramic and a resin film for bonding the film and substrate. The use of corona discharge or plasma (plasma irradiation) would have been obvious to one of ordinary skill in the art as treatment methods used to improve adhesion. Treating the ceramic board substrates with corona discharge or plasma either before or after mounting the SAW devices would have been obvious to one of ordinary skill in the art, as long as the substrate is treated before disposing the resin sheet to be bonded.

(5)

Claims 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-217221 in view of Uchikoba 2002/0044030.

JP 2002-217221 discloses a method of making an electronic device comprising: mounting surface acoustic elements 13 having connection electrode 14 (bump) on a mounting substrate 11 such as of ceramic having conductor pattern 12; arranging a resin film on the elements; softening the resin film by heating to stick to the mounting substrate in the surrounding parts of the elements using a fixture 30 of the shape of frames which contacts the resin film in

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the surrounding parts by pressurizing (jig); hardening the resin film; and cutting (dicing) the mounting substrate and resin film (computer translation [0019], [0044]-[0052]). JP '221 does not disclose treating the surface of the ceramic mounting substrate by plasma.

Uchikoba teaches that in mounting surface acoustic wave (SAW) elements on a ceramic substrate, the ceramic substrate is subjected to a cleaning procedure such as plasma cleaning with argon plasma prior to mounting the SAW elements [0069],[0079].

It would have been obvious to one of ordinary skill in the art to have modified the method of JP 2002-217221 for mounting surface acoustic (SAW) elements on a ceramic substrate by subjecting the ceramic mounting substrate to argon plasma (plasma irradiation) before mounting the elements, as taught by Uchikoba, to clean the ceramic substrate. By subjecting the ceramic substrate to cleaning by argon plasma, the substrate is surface-modification treated by plasma irradiation, as claimed.

(6)

Claims 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-217221 in view of JP 61-295025 Abstract.

JP 2002-217221 discloses a method of making an electronic device comprising: mounting surface acoustic elements 13 having connection electrode 14 (bump) on a mounting substrate 11 such as of ceramic having conductor pattern 12; arranging a resin film on the elements; softening the resin film by heating to stick to the mounting substrate in the surrounding parts of the elements using a fixture 30 of the shape of frames which contacts the resin film in the surrounding parts by pressurizing (jig); hardening the resin film; and cutting (dicing) the

mounting substrate and resin film (computer translation [0019], [0044]-[0052]). JP '221 does not disclose treating the surface of the ceramic mounting substrate by plasma or corona-discharge.

JP 61-295025 Abstract teaches that in bonding a resin thin film to a substrate such as of ceramic, the resin film and substrate may be treated with corona or plasma.

It would have been obvious to one of ordinary skill in the art to have modified the method of JP 2002-217221 for mounting surface acoustic elements on a ceramic mounting substrate by subjecting the ceramic substrate to corona discharge or plasma, as taught by JP '025 Abstract, as treatment performed of both a substrate such as ceramic and a resin film for bonding the film and substrate. The use of corona or plasma would have been obvious to one of ordinary skill in the art as treatment methods used to improve adhesion. Treating the ceramic substrate with corona or plasma either before or after mounting the surface acoustic elements would have been obvious to one of ordinary skill in the art, as long as the ceramic substrate is treated before arranging the resin film to be bonded.

(7)

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa et al. 6,262,513 in view of JP 61-295025 Abstract as applied to claim 33, and further in view of either Tami et al. 5,346,982 or Murata et al. 4,058,443.

Claims 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-217221 in view of JP 61-295025 Abstract as applied to claims 33 and 34, and further in view of either Tami et al. 5,346,982 or Murata et al. 4,058,443.

Tami et al. teach that surface treatments to increase adhesion include corona discharge, ultraviolet irradiation, sand blasting and plasma treatment (col. 9, lines 9-17).

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Murata et al. teach that surface treatments to increase adhesion include corona discharge, ultraviolet irradiation, plasma discharge and laser beams (col. 13, lines 24-29).

It would have been obvious to one of ordinary skill in the art to have used any of the treatments methods including plasma, UV-irradiation, corona discharge, excimer-laser irradiation and sand-blasting to treat the ceramic substrate to increase adhesion to the resin sheet or film, as Tami et al. or Murata et al. teach that any of the methods of corona discharge, ultraviolet irradiation, sand blasting, plasma treatment and laser are used to treat a surface to increase adhesion.

***Allowable Subject Matter***

(8)

Claims 1, 2 and 4-25 are allowed.

***Conclusion***

(9)

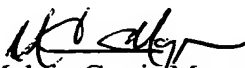
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Melvin Curtis Mayes  
Primary Examiner  
Art Unit 1734

MCM  
November 21, 2005